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THE EXTENSION HORTICULTURIST

September 1, 1924.



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* Frequent recurrence would seem to be the *
* principal characteristic of the 28th of the month; *
* at least that is the way it seems to the editors *
* of the "Extension Horticulturist." Just now the *
* state men are all too busy to write to us and our *
* working folder of material for publication is *
* very much like the proverbial cupboard of "Old *
* Mother Hubbard." *
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* We have received some splendid reports on *
* varieties of fruits adapted for planting in the *
* various states, but these are being reserved for *
* a special number when more of the fruit extension *
* men have been heard from. A little later we de- *
* sire to publish a similar list of vegetable vari- *
* eties. *
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Spraying Orchards from a Central Plant.

Commercial fruit and vegetable production in the United States have grown wonderfully during the past twenty years, in fact, the expansion has been so rapid and the changes so great as to make it difficult to standardize the industry. At present, there is a decided tendency to limit the number of varieties to a few that meet climatic and marketing requirements. In view of the fact that many of our largest fruit and vegetable production enterprises are located near large industrial centers, the wage scale is largely controlled by that of the manufacturing plants and it becomes necessary to employ every possible means of conserving man power. Mr. William Farris, President of the West Virginia State Horticultural Society, gave a most instructive address before the Maryland State Horticultural Society at its annual meeting in Baltimore last January, in which he described his method of spraying by the hydrant or central power station system. We quote the following from this address as contained in the report of the Society:

"The problem we all face now is man power. A few years ago we had plenty of men at reasonable wages; now we cannot get all the men we need at high wages. Therefore, the expenditure of a reasonable amount of money to make a machine do the work of a man always merits our consideration. Our orchard, being located only ten miles from Cumberland, Md., an industrial city with 6,000 men on its daily payroll in factories and shops, compels us to meet the factory wage for common labor, and even meeting this demand does not always enable us to secure all the men we need.

This condition has caused us to do some experimenting with hydrant spraying from a central pumping station. Our experiments have progressed sufficiently to warrant the construction of these operations on a permanent basis. Our orchard lies along the back-bone of Knobley Mountain and slopes down both sides with only about half of our 125 acres of bearing trees fairly level, most of the acreage being quite steep with grades running from 12 to 25 per cent. Most of our crops of 1921 and 1922 were lost in the freezes.

We started out by building a central supply tank but being pressed for money, used forty lard barrels part filled with spraying solution and part pure water, which we constantly replenished with a pump from our spring. For a spray pump we dismantled our old Domestic Spraying Machine which gave us the required pressure up to its capacity. We found our pure water supply was inadequate and that it required a very expensive pumping plant to give us this water fast enough. So we built a 15,000 gallon pure water tank on our highest knob which holds enough to spray our entire orchard. This water flows by gravity into our boiling and mixing and pumping tanks which enables us to run everything to capacity. An inexpensive pumping plant fills this tank between spraying periods.

For a spray pump we now use a self oiling, high pressure, brass lined bulldozer with a capacity of eight gallons per minute at 250 pounds pressure and driven by a 5 H. P. gasoline engine. These machines are bolted to a concrete base giving a maximum efficiency with minimum wear and friction. Our piping system is a one inch double strength galvanized steel main line along the top of the ridge, one-half mile in length. Our laterals are galvanized three-quarter inch pipe running down the mountain side in each direction from this main line at proper intervals, with standard brass globe valves and stub ends to which we screw our rubber hose carrying the spraying nozzles.

The high knob upon which the central plant is located is about one-third of the distance from the north end and we find it advantageous to spray in both directions from this pump when we want the maximum of efficiency. By locating the pumping station near the center of the line, we take advantage of the fact that part of the men are constantly moving from one tree to another and all six do not have open nozzles at the same time. We need four men on the south end and two on the north in order to get over the orchard in minimum time and thus have no trouble in keeping the pressure up at all points.

Originally we had an ordinary 100 gallon spraying machine and pulled it with four mules but later used a crawling type tractor which requires five men to run two spray nozzles, one man running the central pumping station and the other four men operating spray nozzles. Doing more work with the same number of men is the only merit we have discovered in the hydrant spraying system.

For economy's sake we first laid our laterals 500 feet apart and placed our nozzles and valves six rows apart so a man with the 250 foot piece of hose could spray a block six rows of peach trees, 16 to 17 foot centers, 250 ft. long on one side of the line, then cross over and spray an equal amount on the other side of the line. We now find it more economical to lay more lateral lines and to use shorter hose and move oftener. Moving the lateral line from one place to another is not very expensive as they are light and unscrew quickly but it takes labor, and additional labor is what we are trying to eliminate.

This double strength one inch main line cost around ten cents per lineal foot galvanized; the standard would cost about two cents less; the double strength three-quarter inch lateral galvanized cost about eight cents per lineal foot and the standard cost about two cents less. So far the standard has withstood all our pressures; our new lines are all of the heavier weight pipe. We use brass globe valves exclusively and they cost about \$2.00 apiece for the main line and \$1.50 for the lateral line. We have not experimented with gate valves; they are more quickly operated but are subject to leaks. Our pipe is all laid on top of the ground. We find it convenient to take up the lateral lines and pile them at nearby points during the cultivating season and then take them up again at the end of the season when picking commences; this expense being light as a man with a mule to snake the long sections will take up a large amount in a day.

So far we have had little trouble with the pipe clogging from spray sediment. When we finish on any lateral line we open it at the foot and at night flush out with pure water all the open lines. There is a certain amount of scale comes off new pipe when it is first used and this gave us a little trouble, but it did not repeat after the first using. We have no information now that would lead us to think it would even pay to bury our pipes under ground and all our experience so far is against it.

This year we are buying enough new pipe to lay the laterals 300 ft. apart and spray with 150 ft. sections of rubber hose. The most economical distance apart to lay lateral lines will always vary with the cost of steel pipe, labor and other influencing factors. Our concrete tank is 16 feet square on the inside and 18 feet square on the outside and 8 feet deep on inside with floor and walls one foot thick.

The cost of installing this hydrant system would vary with the size and shape of the orchard. A rectangular orchard of 80 acres, one half mile long and one-quarter mile wide would require about 2500 feet of main line at \$300.00; 7,000 feet of laterals at \$700.00; fittings, etc. \$300.00; total \$1300 or about \$16.00 per acre. This is assuming you would dismount your old spray machine and use it for a pump, and that you would use your old hose and guns. One advantage in starting this hydrant system is you do not have to discard your present equipment but can wear it all out. All you have to buy to begin with is your steel pipe and some extra spray hose and guns. You will find your old spray engine and pump dismounted and the nozzles distributed over a larger territory will supply twice as many guns as formerly. You can build your tanks after you have learned by experience their best location and necessary size. When you have to buy new pumps and engines, they do not cost one-third as much as a spray machine, nor as much to operate and they will last longer."

Following Mr. Farris' address questions on the part of the persons in the audience brought out the fact that six nozzles could be run with a man to each nozzle and an additional man to run the central station. When only three men were working it was not found necessary to keep a man full time at the central station. Another point was that one man cannot handle 250 feet of wire-bound hose and that it is better to have sufficient lateral lines so that 150 feet of hose will be sufficient. Mr. Farris also stated that the pipes were flushed out with clean water each time that the work was finished. In reply to the question as to how the tops of the trees were reached from the ground with the ordinary spray gun, Mr. Farris stated that their trees were all practically ten years old and not yet very high.

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Right along the same line of orchard management, Dr. R. A. Jehle, Specialist in Pathology, University of Maryland, gave the following reasons for lack of control of scab in sprayed apple orchards in Maryland:

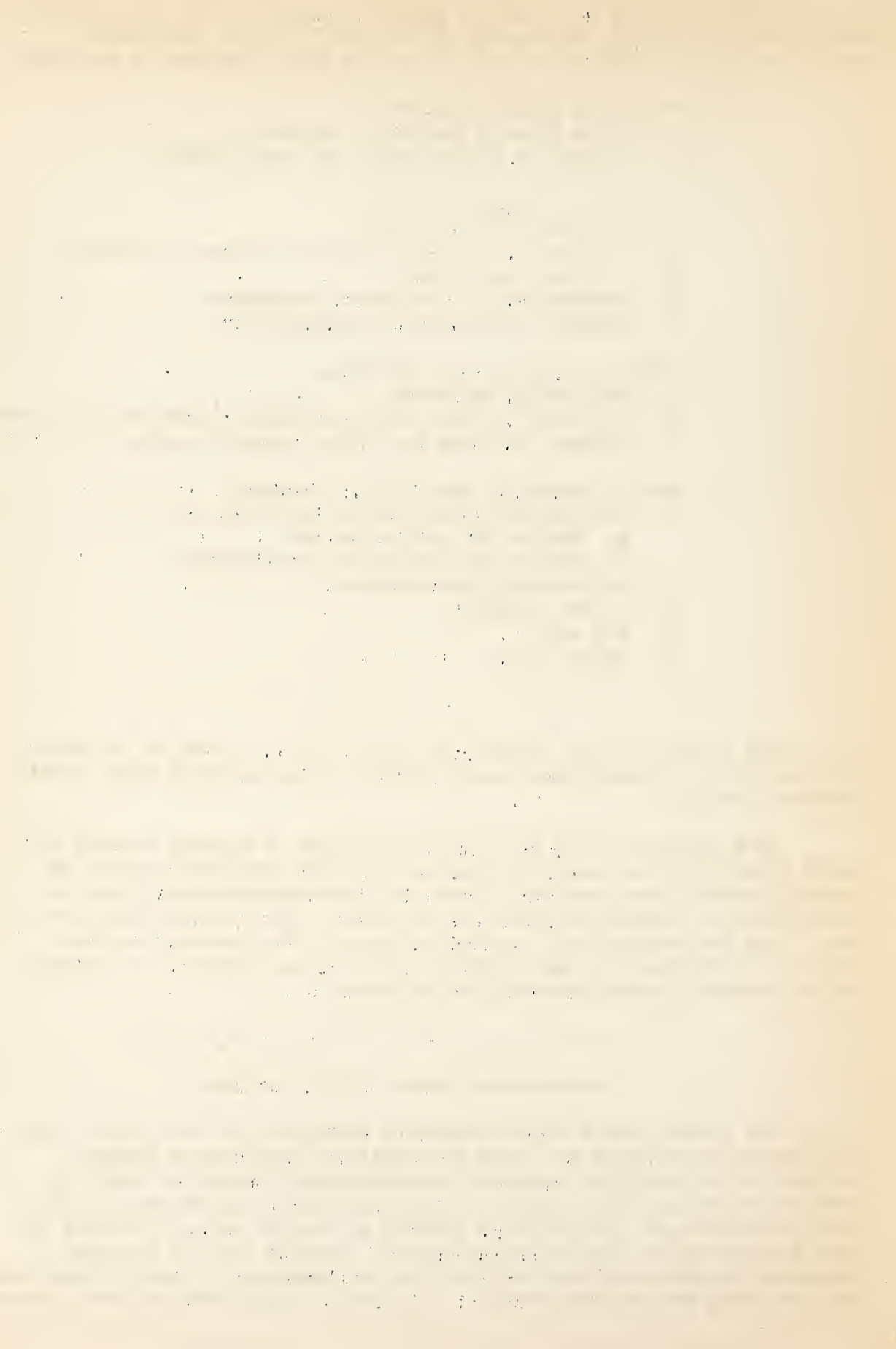
- " 1. Trees too close together.
 - a. Trees planted too close together.
 - b. Failure to remove apple and peach fillers.
2. Careless spraying operations.
 - a. Spraying with wind only.
 - b. Failure to spray under side of leaves and fruits.
 - c. Spraying too rapidly.
 - d. Spraying with "fire hose" equipment.
 - e. Spraying with defective equipment.
3. Failure to spray at right time.
 - a. Inadequate equipment.
 - b. Variation in time when scab spores ripen on dead leaves.
 - c. Failure to spray just before rainy periods.
4. Use of materials which fail to control.
 - a. Concentrated lime-sulphur solutions too weak.
 1. Failure to test solution.
 2. Use of too little dry lime-sulphur.
 - b. Self-boiled lime-sulphur.
 - c. Atomic sulphur.
 - d. Dry mix.
 - e. Sulco V-B. "

The full report as given by Dr. Jehle will be found in the Proceedings of the Twenty-Sixth Annual Meeting of the Maryland State Horticultural Society.

Just at present with the rapid development of dusting methods as a means of controlling insect and disease troubles with the orchard and garden, it would seem unwise to incur any great expenditure in the establishment of centralized spraying equipment. The fact remains, however, that the orchardists, especially those in the mountain sections where it is difficult to use portable sprayers and dusters, are finding the centralized system extremely satisfactory.

Massachusetts Notes - By R. M. Koon.

The Market Garden Field Station at Lexington has been sold. The station will be removed to a much more suitable location at Waltham. The area on the new site comprises approximately 60 acres of land, 24 acres of which are admirably suited to experimental and demonstrational work in vegetables. This soil is typical of the upland soil devoted to market gardening in eastern Massachusetts. Another area of 20 acres comprises an undrained muck soil similar to thousands of acres of unclaimed lowland along the Atlantic Coast. This land has been surveyed with a view



to tiling, since it possesses unusual advantages from the standpoint of research and demonstration. The remaining acreage includes the administration building, laboratories, exhibition hall and service buildings.

Plans are in process for the erection of a new greenhouse for experimental purposes. The specifications call for a house 30 x 200 divided into eight compartments. The heat will be supplied by the latest approved type of oil burning system. The oil burner has proved to be particularly advantageous for greenhouse heating at the Lexington Station, and where it has been installed elsewhere in the state.

The interest manifested by the market gardeners in the work at the station has been great in the past, and it is even greater now that the opportunity for developing a more comprehensive program is offered. The market gardeners have supported this project from the beginning. When the shadow of uncertainty rested upon the proposal in its passage through the State House, the gardeners stood behind it as one man and threw their influence in its favor. Now that removal to Waltham is an assured fact, these loyalists meet on the new ^{site} to suggest, advise and help with their sound practical ideas borne of long experience."

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Horticultural Extension Literature Received
During August, 1924.

Arkansas - College of Agriculture, Fayetteville.
Handling and Loading Grapes - Ext. Cir. No. 171, June 1924.
Florida - University of Florida, Gainesville.
Strawberry Production in Florida - Bul. 40, June 1924.
Georgia - State College of Agriculture, Athens.
Peach Growing in Georgia - Bul. 169, Revised, July 1924.
Kansas - State Agricultural College, Manhattan.
Potato Leaf Hopper - Leaflet, June 1924.
Fire Blight - Leaflet, June 1924.
New Jersey - State College of Agriculture, New Brunswick.
Vegetable Yields in New Jersey - Ext. Bul. 37, May 1924.
Ohio - Ohio State University, Columbus.
Rotations for Truck Farming - Timely Soil Topics No. 74, July 1924.
Oregon - Agricultural College, Corvallis.
Seed Potato Certification for 1924 - Ext. Bul. 375, May 1924.
Virginia - Virginia Polytechnic Institute, Blacksburg.
Selecting and Exhibiting Fruit - Bul. 84, October 1923.
The Propagation of the Common Fruits of Virginia - Bul. 87, Feb. 1924.
Orchard Spraying in Virginia - Bul. 88, Feb. 1924.
Virginia Apples and the Southern Markets - Bul. 91, June 1924.
Wisconsin - College of Agriculture, Madison.
How to Save Girdled Trees - Stencil Bul. 75, April 1924.

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Extension Horticulturists.

